

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION 6

PLANS

Letting Date: February 21, 2024

CONTRACT ID: DF00468

TIP NO.: -----

FEDERAL AID NO.: STATE FUNDED

WBS ELEMENT NO.: 2024CPT.06.14.10241.1 & 2024CPT.06.14.20241.1

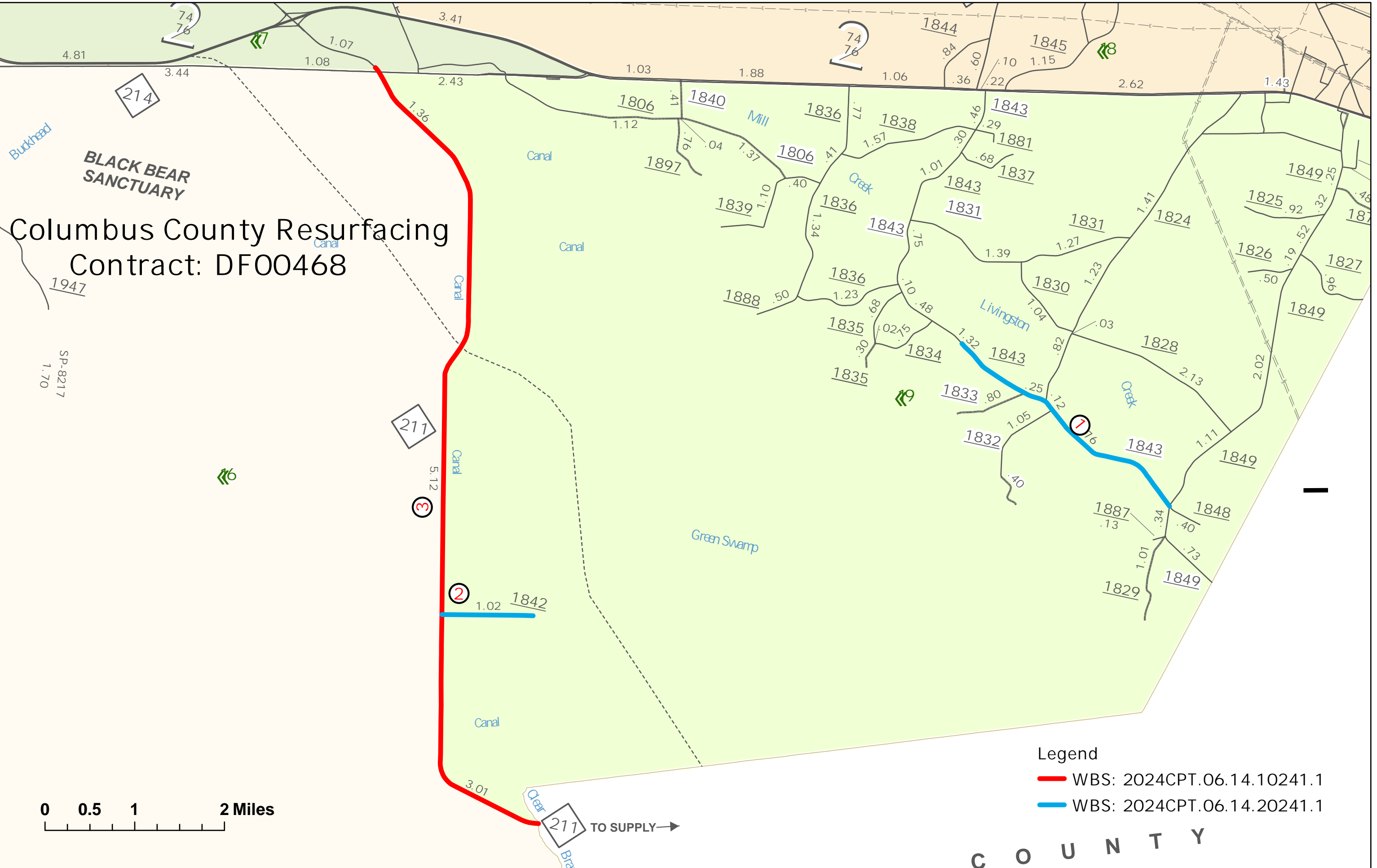
ROUTE NO.: VARIES

LOCATION: VARIES

COUNTY: COLUMBUS

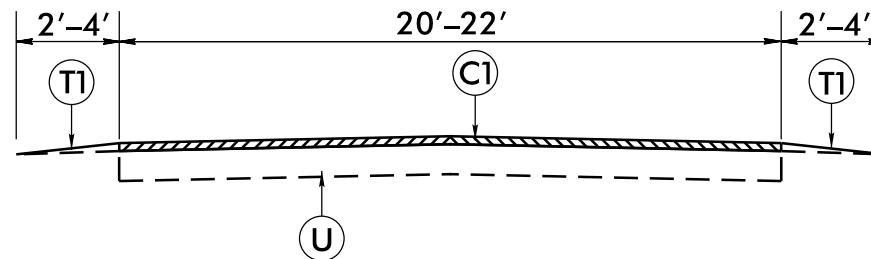
LENGTH OF PROJECT: 13.6 MILES

TYPE OF WORK: RESURFACING, MILLING & PAVEMENT MARKINGS



PAVEMENT SCHEDULE

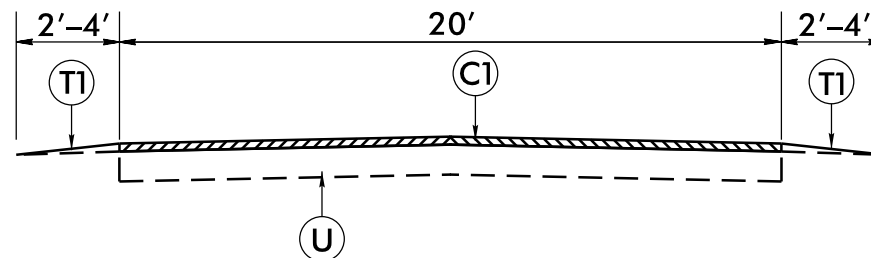
C1	1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D1	2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
E1	4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T1	SHOULDER RECONSTRUCTION WITH AGGREGATE SHOULDER BORROW
U	EXISTING PAVEMENT
V1	0" - 1½" MILLING
V2	¾" MILLING
V3	1½" MILLING
V4	2½" MILLING
Y	SINUSOIDAL MILLED RUMBLE STRIPE



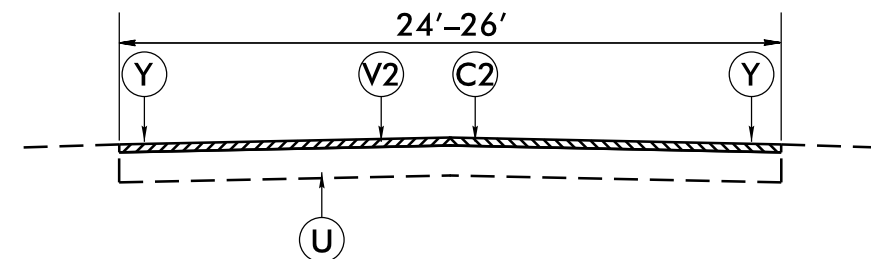
TYPICAL SECTION NO. 1

-PLUS 2' INSIDE CURVE WIDENING (SEE DETAIL)

-PLUS 2.5" MILL AND FILL WITH I19.0C (SEE DETAIL 1)

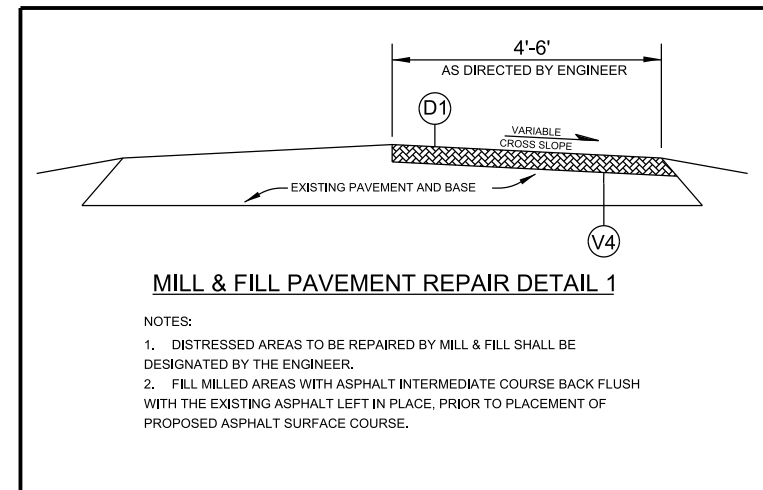


TYPICAL SECTION NO. 2



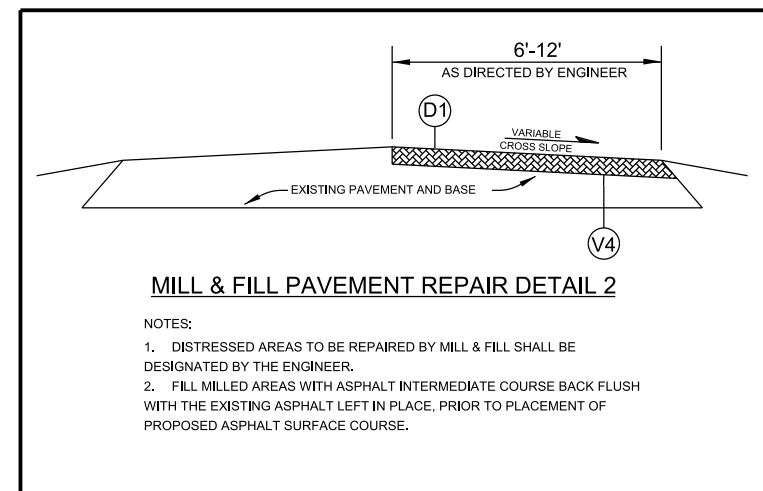
TYPICAL SECTION NO. 3

-PLUS 2.5" MILL AND FILL WITH I19.0C (SEE DETAIL 2)



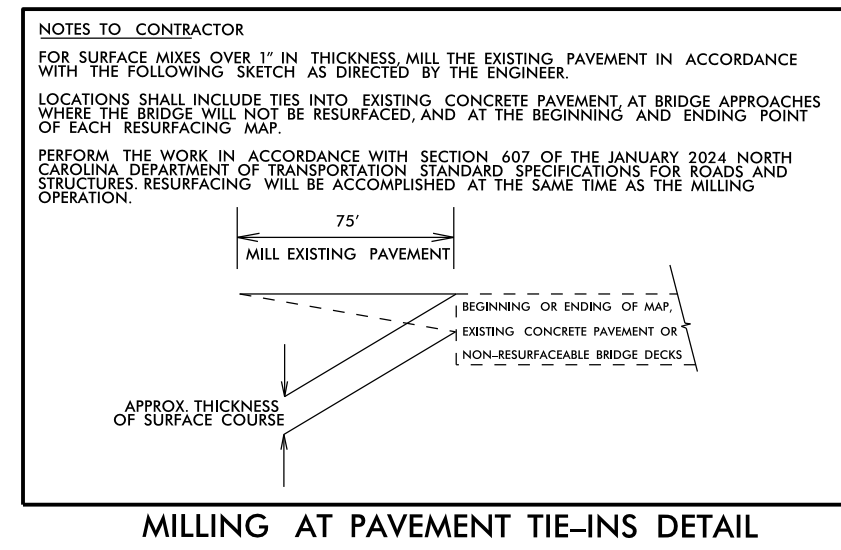
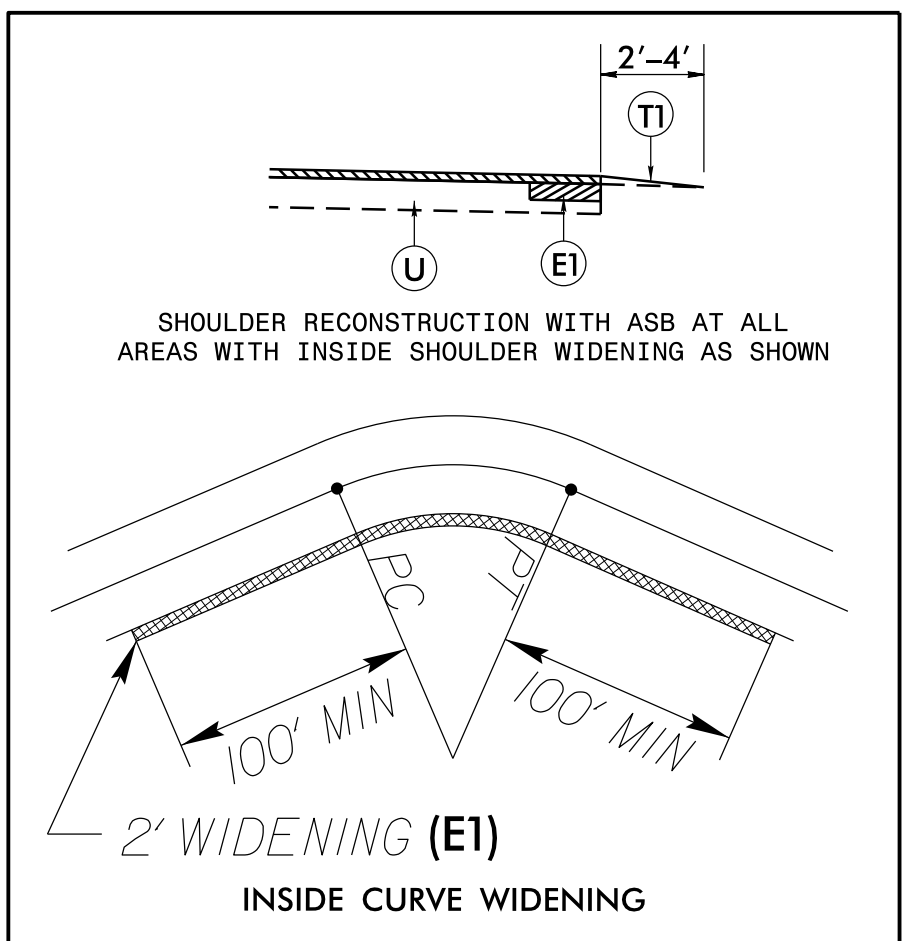
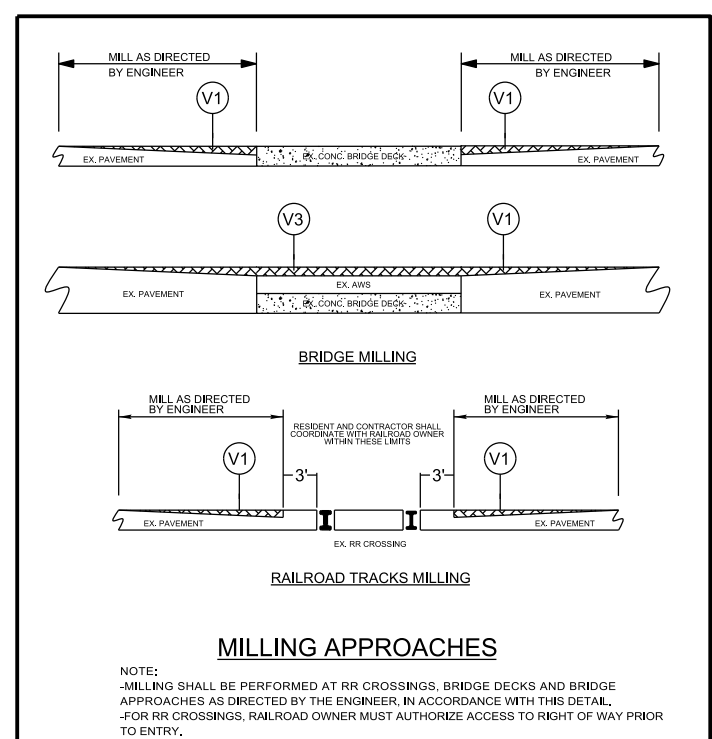
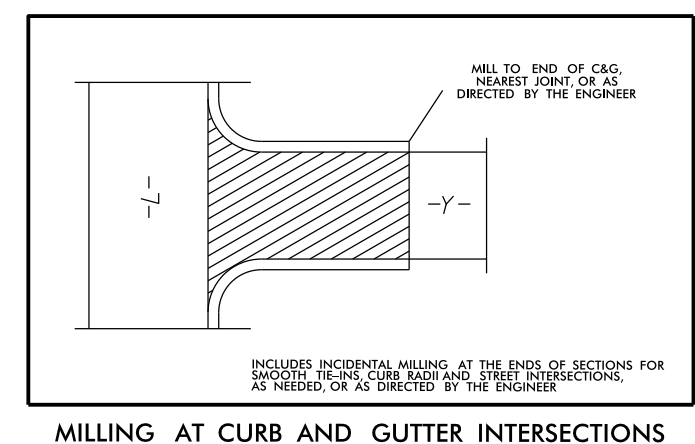
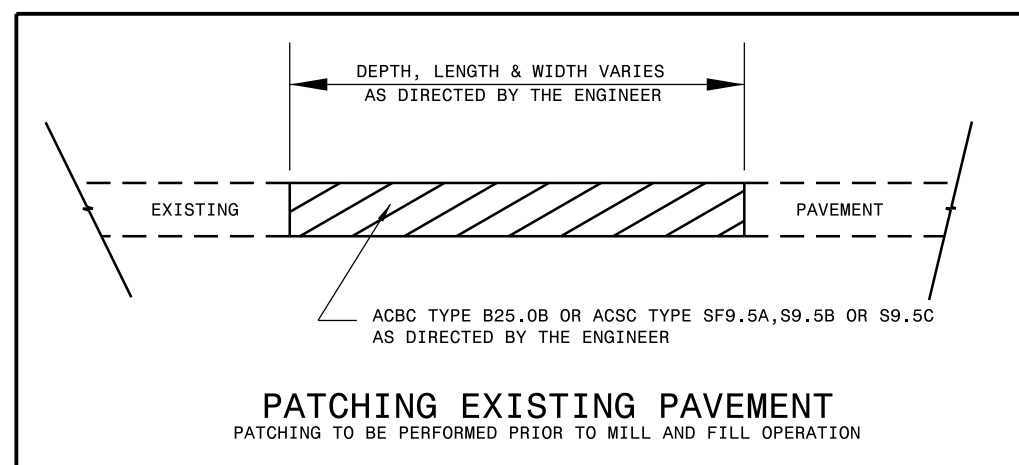
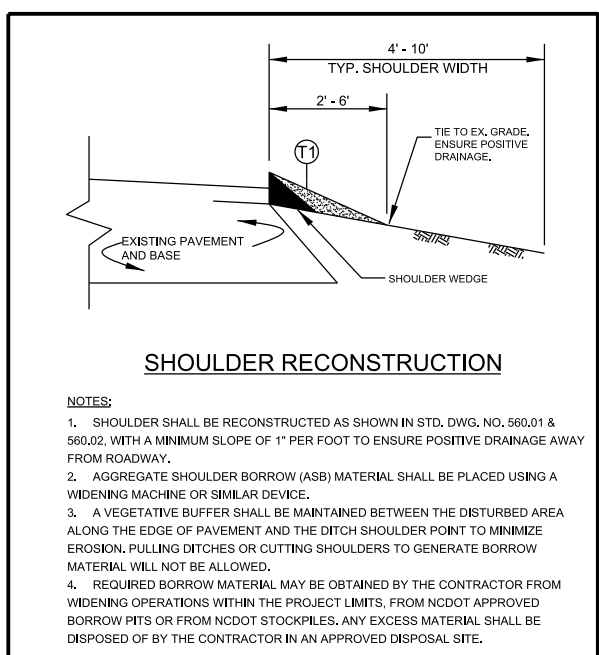
MILL & FILL PAVEMENT REPAIR DETAIL 1

- NOTES:
1. DISTRESSED AREAS TO BE REPAIRED BY MILL & FILL SHALL BE DESIGNATED BY THE ENGINEER.
 2. FILL MILLED AREAS WITH ASPHALT INTERMEDIATE COURSE BACK FLUSH WITH THE EXISTING ASPHALT LEFT IN PLACE, PRIOR TO PLACEMENT OF PROPOSED ASPHALT SURFACE COURSE.



MILL & FILL PAVEMENT REPAIR DETAIL 2

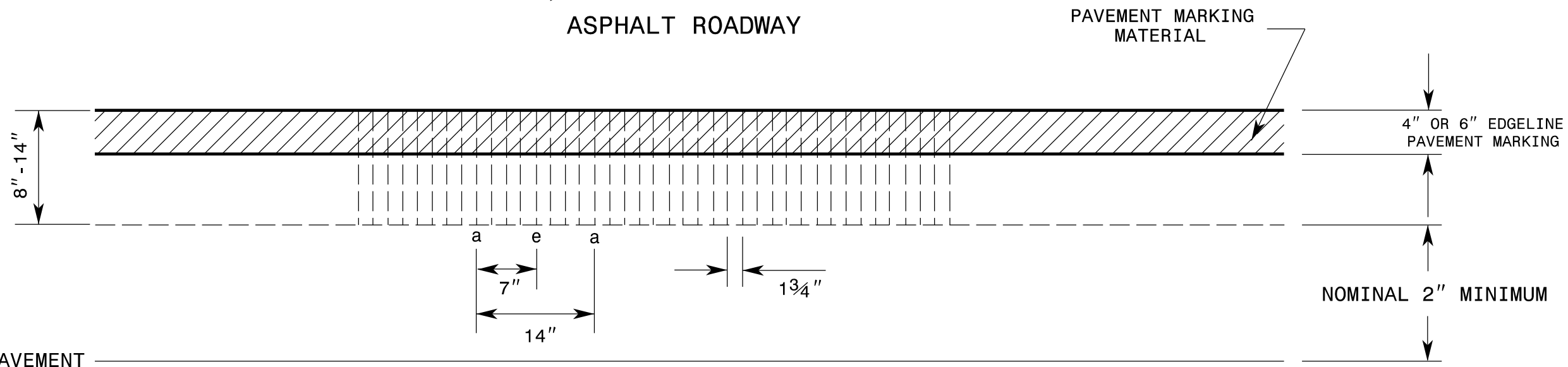
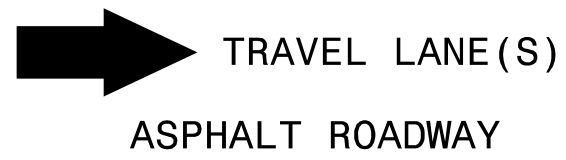
- NOTES:
1. DISTRESSED AREAS TO BE REPAIRED BY MILL & FILL SHALL BE DESIGNATED BY THE ENGINEER.
 2. FILL MILLED AREAS WITH ASPHALT INTERMEDIATE COURSE BACK FLUSH WITH THE EXISTING ASPHALT LEFT IN PLACE, PRIOR TO PLACEMENT OF PROPOSED ASPHALT SURFACE COURSE.



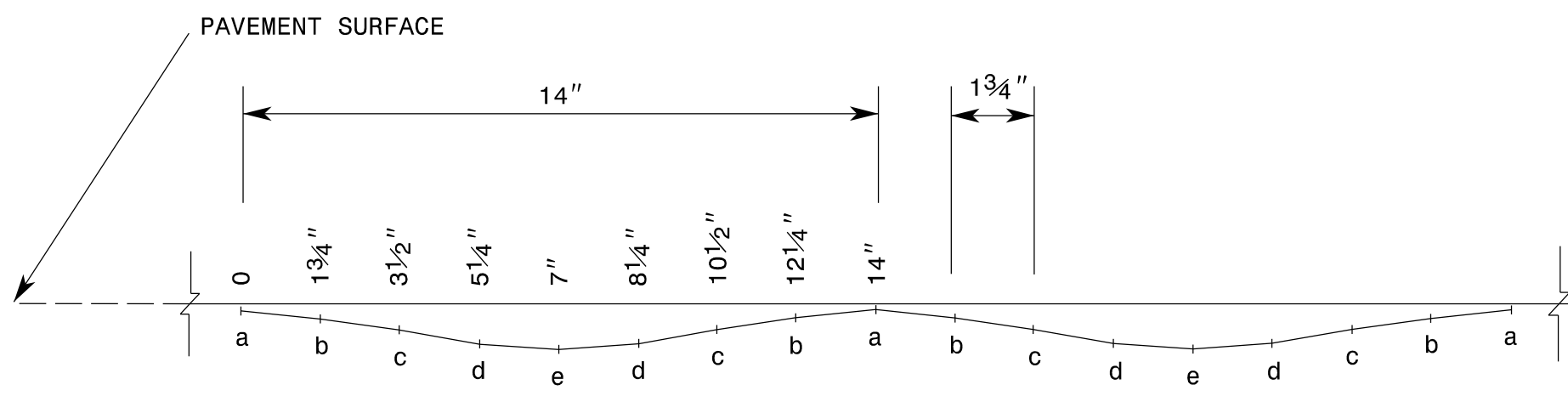
6/2/99 18-JAN-2024 10:01

See Table 1 within Rumble Strip Policy for Design Guidance

PLAN VIEW



PROFILE VIEW



LOCATION	DEPTH	
	MIL	INCHES
a	62.5	1/16"
b	125	1/8"
c	219	7/32"
d	344	11/32"
e	375	3/8"

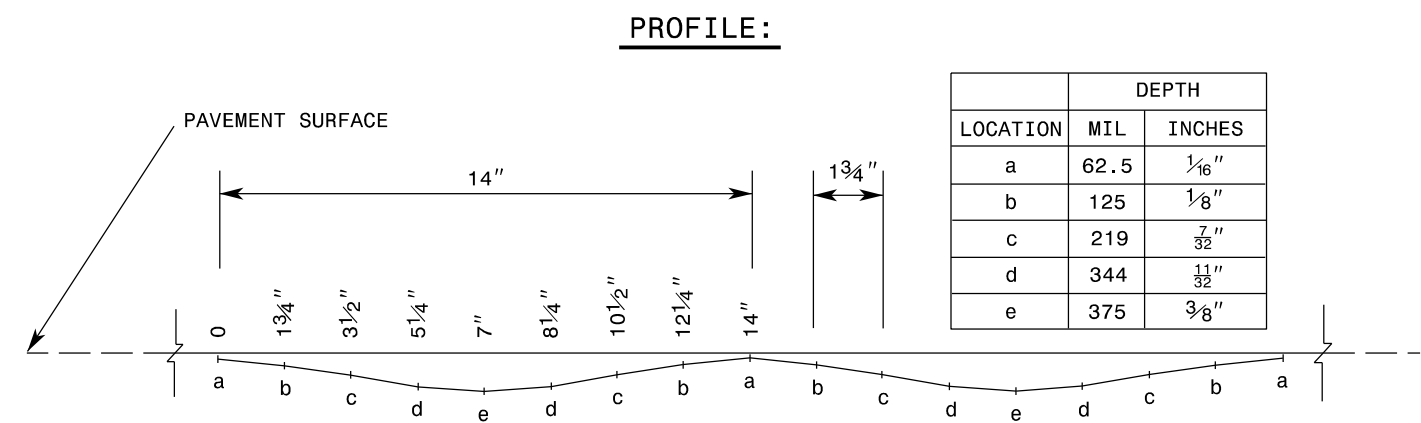
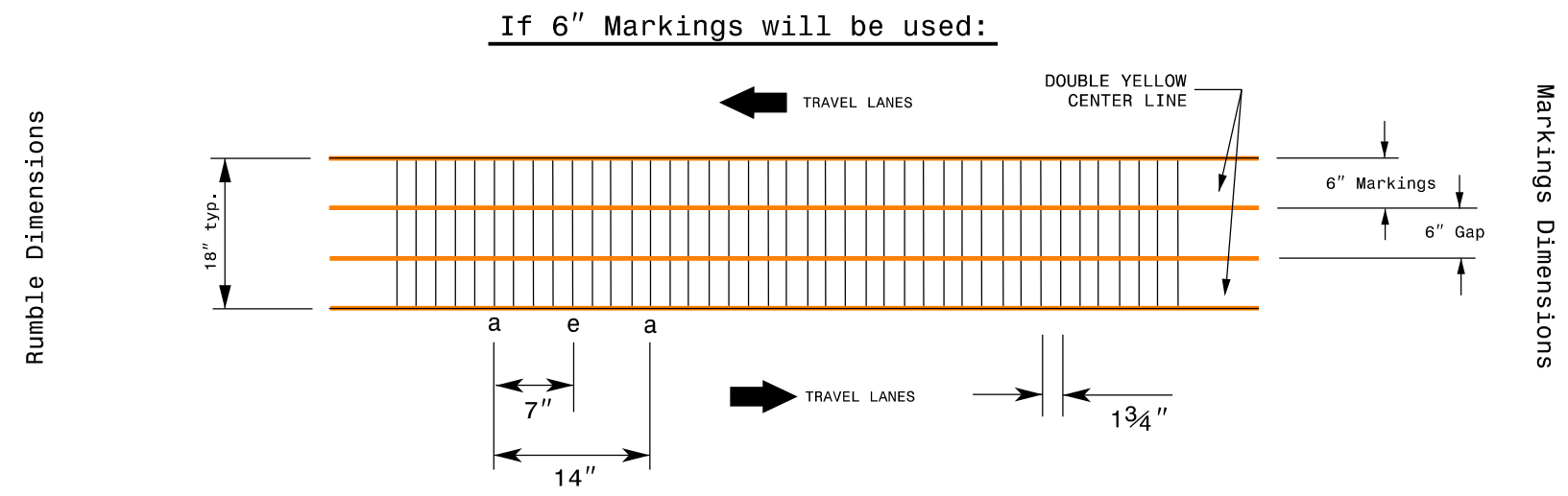
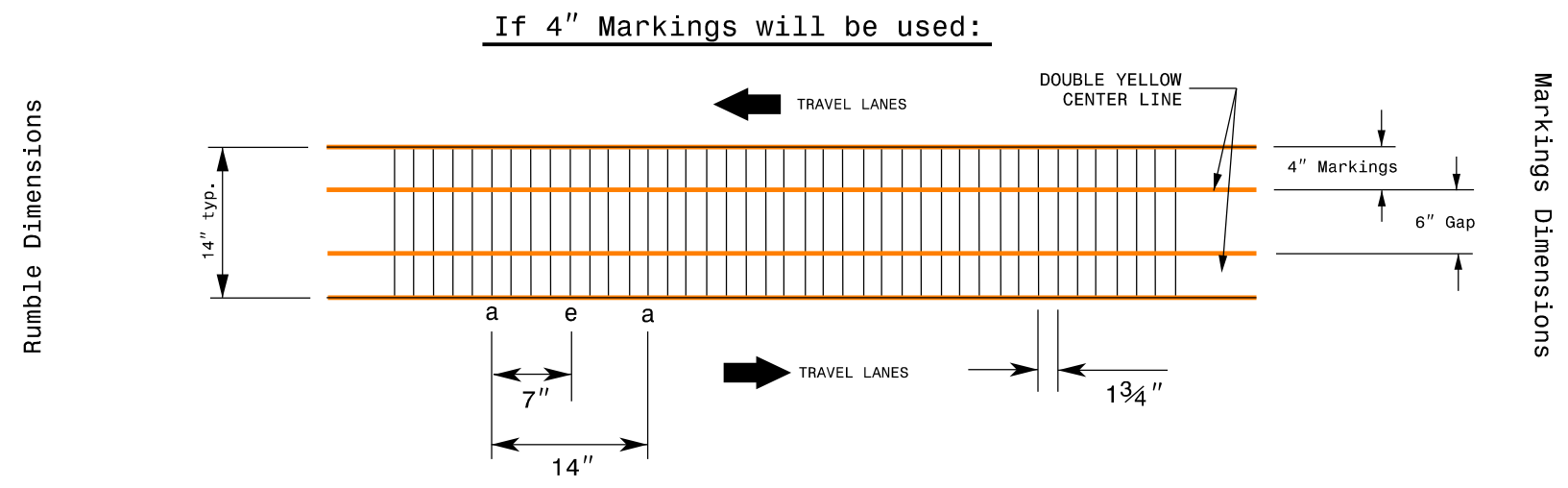
REFERENCE DRAWING ID: Sin.Stripe

DRAFT REFERENCE DRAWING: FEBRUARY 2023

NOTES:

- 1) Specification in table taken from MNDOT Research Project Final Report 2016-23: *Sinusoidal Rumble Strip Design Optimization Study By: Terhaar et. al, June 2016*
- 2) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS.
- 3) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.

See Table 2 within Rumble Strip Policy for Design Guidance



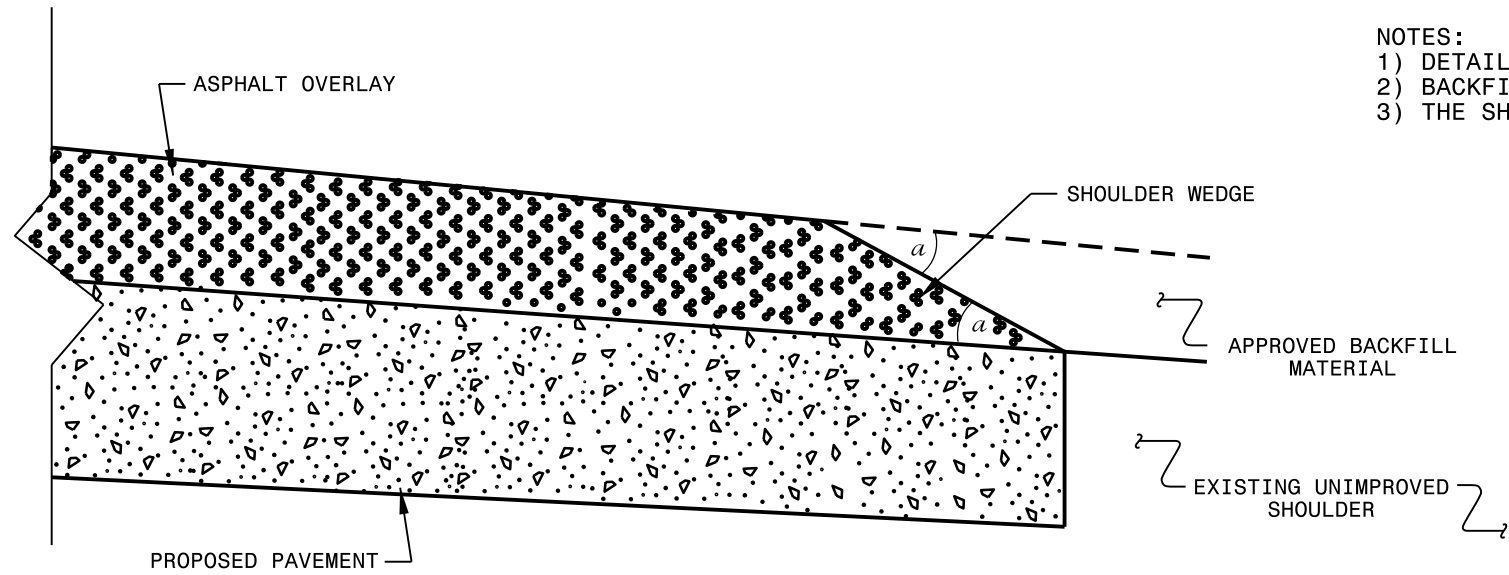
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DRAFT REFERENCE DRAWING: FEBRUARY 2023

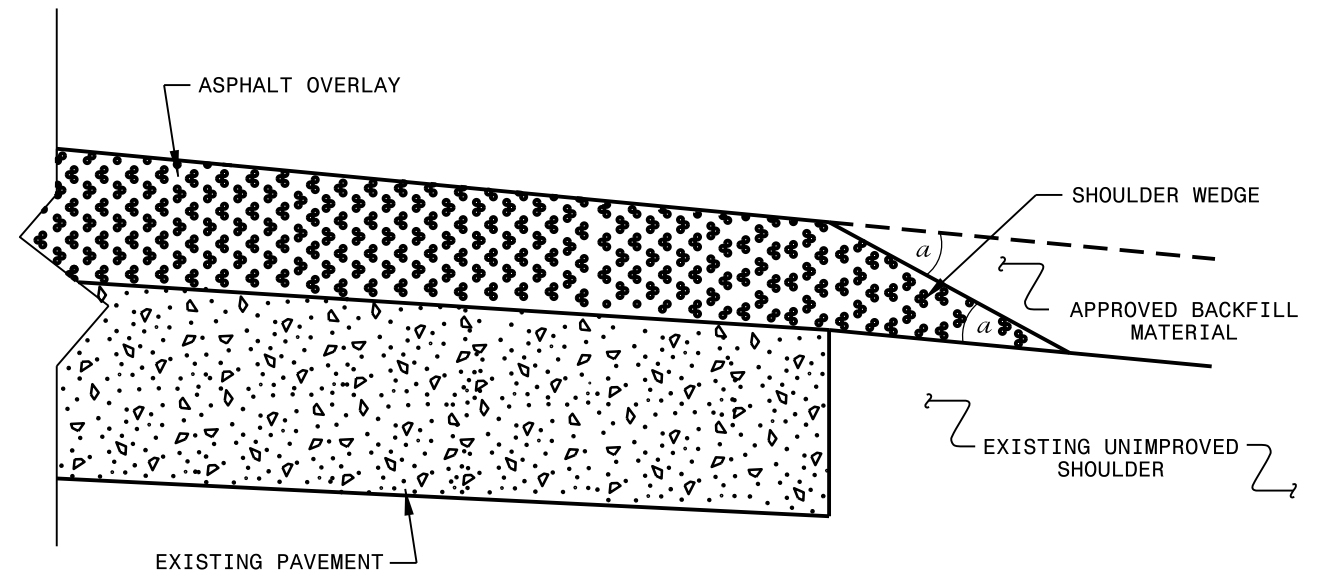
NOTES:

- 1) Specification in table taken from MNDOT Research Project Final Report 2016-23: *Sinusoidal Rumble Strip Design Optimization Study By: Terhaar et. al, June 2016*
- 2) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS.
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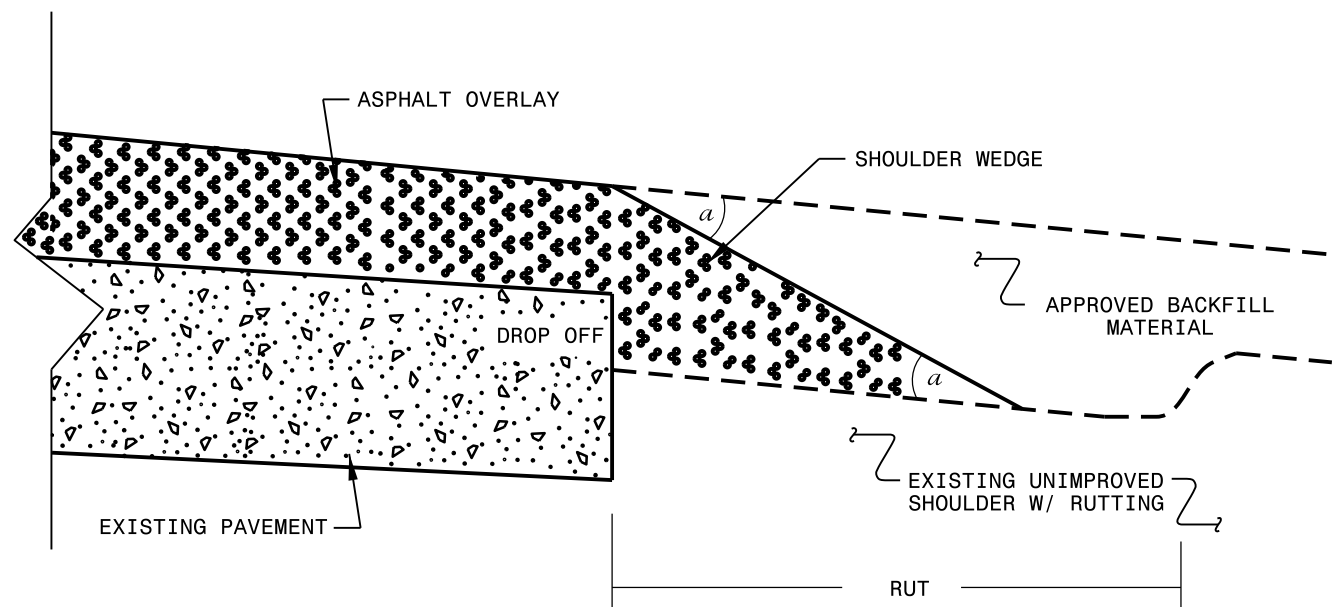
- NOTES:
- 1) DETAIL DOES NOT APPLY TO OGAFD AND ULTRA-THIN BONDED WEARING COURSE.
 - 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
 - 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS AND SIDE STREETS.



SHOULDER WEDGE DETAIL
(Resurfacing Projects w/ Widening or with Existing Paved Shoulder having no dropoffs)



SHOULDER WEDGE DETAIL
(Resurfacing Projects w/ NO Widening)



SHOULDER WEDGE DETAIL
(Resurfacing Adjacent to Rutted Shoulder)

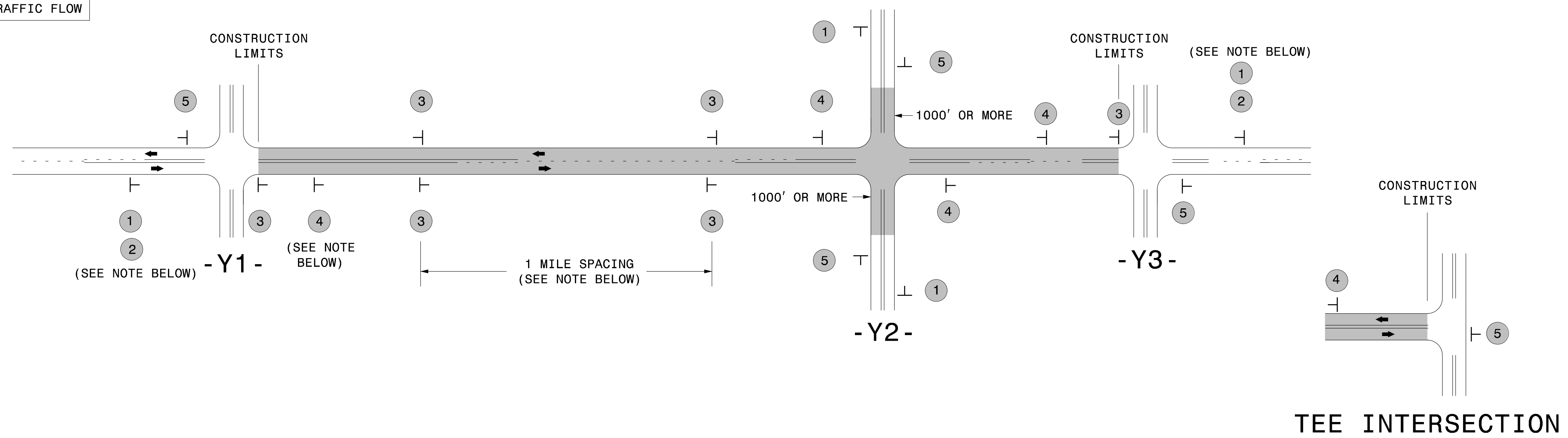
- SHOULDER WEDGE ANGLE = 30°

CONTRACT STANDARDS AND DEVELOPMENT UNIT Office 919-707-6950 FAX 919-250-4119			
SHOULDER WEDGE DETAILS			
ORIGINAL BY: T.SPELL	DATE: 7-19-11		
MODIFIED BY:	DATE: 10/16/12		
CHECKED BY:	DATE:		
FILE SPEC.: susr/details/stand/shoulderwedgedetail.dgn			

SYSTEMS DESIGN USER NAME

SIGNING FOR RESURFACING PROJECTS

LEGEND
 ┆ STATIONARY SIGN
 ← DIRECTION OF TRAFFIC FLOW



MAINLINE (-L-) SIGNING

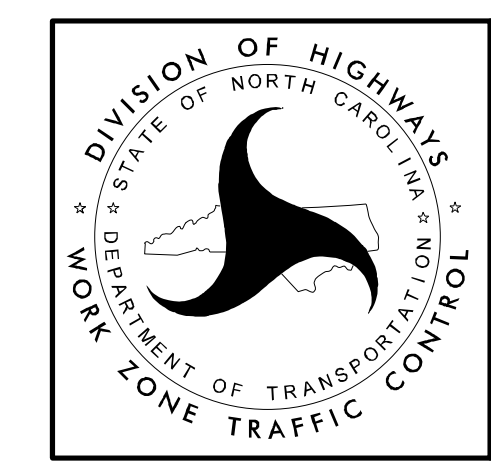
-Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	1		PLACE 1000' PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000' ALONG -Y- LINE.	<p>NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:</p> <ol style="list-style-type: none"> LESS THAN 1000' OF RESURFACING ALONG -Y- LINE SUBDIVISION ROADS DEAD END ROADS <p>WHEN PAVING/CONSTRUCTION ACTIVITIES PROCEED ACROSS AN UNSIGNED -Y- LINE, PORTABLE ADVANCE WARNING SIGNS SHALL BE USED ALONG THE -Y- LINE AS SHOWN BELOW. REMOVE UPON COMPLETION OF WORK.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> W20-1 48" X 48" PLACED 500' IN ADVANCE OF FLAGGER. </div> <div style="text-align: center;"> W20-7 A 48" X 48" PLACED 250' IN ADVANCE OF FLAGGER. </div> </div>
	2		#2 SIGN ONLY USED WHEN CONSTRUCTION LIMITS ARE 2 OR MORE MILES IN LENGTH. ROUND UP TO NEXT WHOLE NUMBER. (NO FRACTIONAL OR DECIMAL NUMBERS)	
	3		- PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACE 1 MILE APART THEREAFTER. - AT TEE INTERSECTIONS INSTALL INITIALLY 1/2 MILE FROM INTERSECTION AND SPACE 1 MILE APART THEREAFTER.	
	4		- THESE ARE FOR -Y- LINES THAT ARE "THROUGH" ROADWAYS. - DEAD END AND SUBDIVISION ROADS ARE NOT "THROUGH" ROADWAYS. - INSTALL 500' +/- FROM EACH -Y- LINE APPROACH AS SHOWN ABOVE. - FOR MULTIPLE -Y- LINES THAT ARE SEPARATED BY 0.25 MILES OR LESS, TREAT AS A SINGLE UNIT AND INSTALL WITHIN 500' OF EACH APPROACH. - A MAXIMUM OF 2 SIGN SETS PER MILE. DO NOT INSTALL WHEN -Y- LINES ARE WITHIN 0.5 MILES FROM "END ROAD WORK" SIGN. - FOR TEE INTERSECTIONS, INSTALL WITHIN 500' +/- OF THE INTERSECTION ALONG -L- LINE.	
	5		PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS OR AS SHOWN WHEN WORK ENDS AT A 3-WAY TEE INTERSECTION.	

THE ABOVE SIGNS ARE ALL THAT ARE REQUIRED FOR A CONTRACTOR TO BEGIN A RESURFACING CONTRACT. ANY ADDITIONAL SIGNS REQUESTED BY NCDOT DIVISIONS SHALL BE INSTALLED WITHIN 7 BUSINESS DAYS OF THE START OF CONTRACT WORK.

MAPS LESS THAN 2 MILES

FOR RESURFACING MAPS WITH CONSTRUCTION LIMITS LESS THAN 2 MILES IN LENGTH, NO STATIONARY SIGNS ARE REQUIRED. USE PORTABLE "ROAD UNDER CONSTRUCTION" OR "ROAD WORK AHEAD" SIGNS IN LIEU OF STATIONARY ADVANCE WARNINGS SIGNS.



ADVANCE WARNING SIGNS FOR RURAL AND SUBURBAN 2-LANE ROADWAY RESURFACING

GUIDELINES FOR LANE WIDTHS ON RESURFACING PROJECTS

Contractor shall place the new pavement markings in accordance with this table and detail unless otherwise directed by the Engineer.

TWO LANE - TWO WAY ROADWAY - 55 MPH		
ROADWAY WIDTH	LANE WIDTH	SHOULDER WIDTH
18'	9' *	0'
20'	10' *	0'
22'	10'	1'
24'	10'	2'
26'	11'	2'
28'	12'	2'
32'	12'	4'

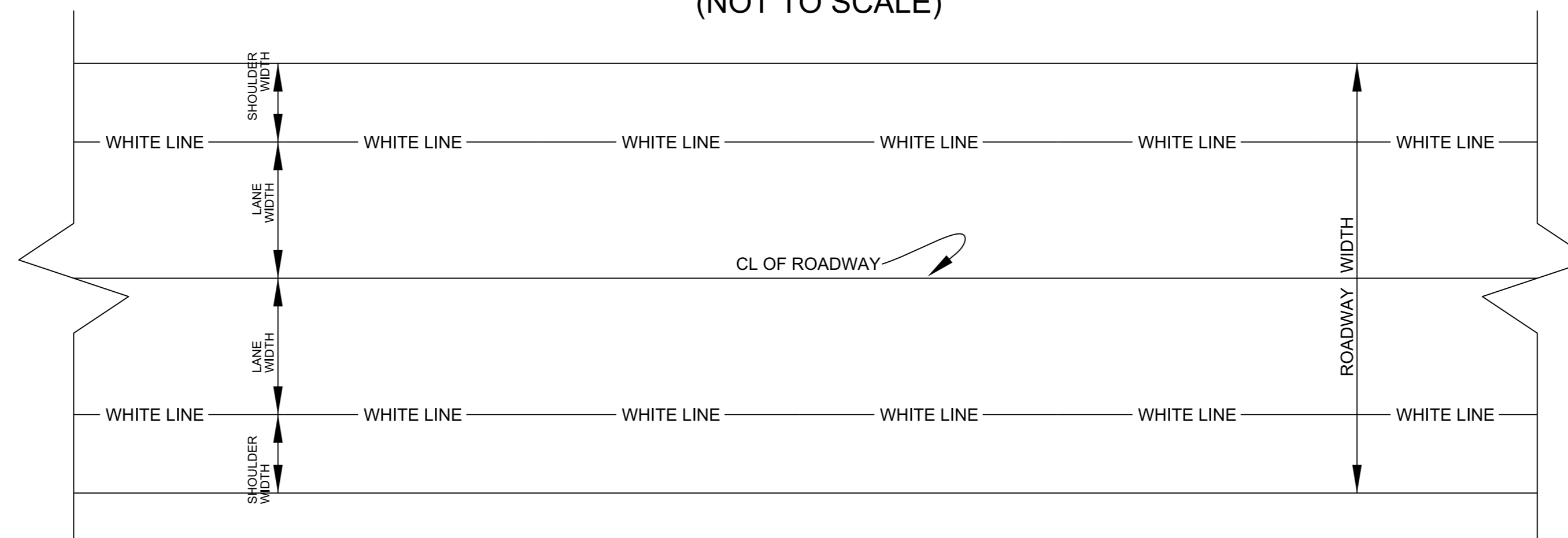
* May vary due to pavement width

TWO LANE - TWO WAY ROADWAY		50
MPH OR LESS		
ROADWAY WIDTH	LANE WIDTH	SHOULDER WIDTH
18'	9' *	0'
20'	10' *	0'
22'	10'	1'
24'	10'	2'
26'	11'	2'
28'	11'	3'
32'	11'	5'

* May vary due to pavement width

SCHEMATIC OF ROADWAY

(NOT TO SCALE)



PROJECT NO.	SHEET NO.	TOTAL NO.
2024CPT.06.14.20241.1, 2024CPT.06.14.10241.1		

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH	WIDTH	BEGIN MP	END MP	1245000000-E	1260000000-E	1297000000-E	1330000000-E	1491000000-E	1503000000-E	1519000000-E	1520000000-E	1523000000-E	1524000000-E	1575000000-E	1704000000-E	1881000000-E			
														SHOULDER RECONSTRUCTION	AGGREGATE SHOULDER BORROW	2 1/2" MILLING	0.75" MILLING	INCIDENTAL MILLING	BASE COURSE, B25.0C	INTERMEDIATE COURSE, I19.0C	SURFACE COURSE, S9.5B	LEVELING COURSE, S9.5B	SURFACE COURSE, S9.5C	LEVELING COURSE, S9.5C	ASPHALT BINDER FOR PLANT MIX	PATCHING EXISTING PAVEMENT	SINUSOIDAL RUMBLE STRIPES		
														SMI	TON	SY	SY	SY	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	LF	
2024CPT.06.14.20241.1	Columbus	1	SR-1843 / LIVINGSTON CHAPEL RD	FROM SR 1849 TO M.P. 3.0		2		NO	NO	3.03	20	0	3.03	6.06	909	1,238		167	96	190	3,247	304			246	29			
2024CPT.06.14.20241.1	Columbus	2	SR-1842 / CAROLINA AVE	FROM NC 211 TO DEAD END		2		NO	NO	1.02	20	0	1.02	2.04	306						1,093					71			
TOTAL FOR PROJ NO. 2024CPT.06.14.20241.1										4.05				8.10	1,215	1,238		167	96	190	4,340	304			317	29			
														1,238															
2024CPT.06.14.10241.1	Columbus	3	NC-211	FROM BRUNSWICK CO TO NC 214		2	2WU	NO	NO	9.55	24	0	9.55			4,500	139,910	3,490		629					12,711	22	782	8	151,272
TOTAL FOR PROJ NO. 2024CPT.06.14.10241.1										9.55						4,500	139,910	3,490		629					12,711	22	782	8	151,272
														144,410															
GRAND TOTAL										13.6				8.10	1,215	5,738	139,910	3,657	96	819	4,340	304			12,711	22	1,099	37	151,272
														145,648															

PROJECT NO.	SHEET NO.	TOTAL NO.
2024CPT.06.14.20241.1, 2024CPT.06.14.10241.1		

THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	BEGIN MP	END MP	4413000000-E	4457000000-N	4685000000-E		4688000000-E		4695000000-E	4700000000-E	4725000000-E			4810000000-E		4835000000-E	4709000000-E	4892000000-N	4900000000-N					
												WORK ZONE ADVANCE/GENERAL WARNING SIGNING	TEMPORARY TRAFFIC CONTROL	4" X 90 M WHITE THERMO	4" X 90 M YELLOW THERMO	6" X 90 M WHITE THERMO	6" X 90 M YELLOW THERMO	8" X 90 M WHITE THERMO	12" X 90 M WHITE THERMO	THERMO STR ARROW 90 M	THERMO RT ARROW 90 M	THERMO LT ARROW 90 M	4" YELLOW PAINT	4" WHITE PAINT	24" WHITE PAINT	24" X 90 M WHITE THERMO	24" YIELD LINE SYMBOL	YELLOW & YELLOW MARKERS	CRYSTAL & RED MARKERS				
												SF	LS	LF	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	EA	EA	EA					
2024CPT.06.14.20241.1	Columbus	1	SR-1843 / LIVINGSTON CHAPEL RD	FROM SR 1849 TO M.P. 3.0		2		3.03	20	0	3.03	166	0.22	32,603	7,500																		
2024CPT.06.14.20241.1	Columbus	2	SR-1842 / CAROLINA AVE	FROM NC 211 TO DEAD END		2		1.02	20	0	1.02	72	0.08																				
TOTAL FOR PROJ NO. 2024CPT.06.14.20241.1								4.05				238	0.30	32,603	7,500																		
												40,103																					
2024CPT.06.14.10241.1	Columbus	3	NC-211	FROM BRUNSWICK CO TO NC 214		2	2WU	9.55	24	0	9.55	374	0.70	830	600	102,758	71,625	80	50	2	1	2	71,625	1,000	65	65	53	764	50				
TOTAL FOR PROJ NO. 2024CPT.06.14.10241.1								9.55				374	0.700	830	600	102,758	71,625	80	50	2	1	2	71,625	1,000	65	65	53	764	50				
												1,430		174,383						5		72,625				814							
GRAND TOTAL								13.6				612	1.000	33,433	8,100	102,758	71,625	80	50	2	1	2	71,625	1,000	65	65	53	764	50				
												41,533		174,383				5		72,625		814											